Preface: SING 14

Algaba, Encarnación; van den Brink, René; Grabisch, Michel; Steffen, Frank

Link to publication in VU Research Portal

Preface: SING 14

Encarnación Algaba[1] · René van den Brink[2] · Michel Grabisch[3] · Frank Steffen[4]

This special issue is centered around papers that were submitted to the 2018 European Meeting on Game Theory SING 14, held in Bayreuth. The European Meeting on Game Theory, better known through the acronym SING (Spain, Italy, Netherlands Game Theory) is the most important series of conferences in Europe about Game Theory. It takes place annually with the aim of promoting scientific cooperation and exchanges about the new trends on the main theoretical and applied advances in game theory, within the European Union and between Europe and other parts of the World.

The history of the SING conferences dates back to 1983 with the first meetings being held in Italy. Since 2001, when Spanish scholars got involved in the organization, the conferences take place on a regular annual basis. The acronym SING was introduced in 2005 when scholars from the Netherlands joined. Then, subsequently, meetings were held in Spain, the Netherlands, Poland, France, Hungary, Russia, Denmark, and Germany. Since 2014 this conference series is called the"European Meeting on Game Theory", when scholars from Poland got involved in the organization of a SING meeting for the second time. Currently, there are five representative countries according to the history of SING: Italy, Spain, The Netherlands, Poland, and France.

SING 14 was the first conference of the series organized in Germany. The call for papers for the SING 14 meeting in Bayreuth led to 206 contributions from over 30 countries. The submitted contributions dealt with a variety of topics in game theory and its applications. The final scientific program comprised around 115 presentations and three plenary sessions. A total of over 130 participants attended the conference. As expected, there were many European participants, especially from Italy, the Netherlands, Poland, and Spain. In addition, for the first time in the history of the conference, a large number of German scholars participated as well. Other focus countries of the conference were China and Japan as well as Canada and the US.

✉ Michel Grabisch
michel.grabisch@univ-paris1.fr

1 Department of Applied Mathematics II and IMUS, E.T.S de Ingeniería, University of Sevilla, Camino de los Descubrimientos s/n, 41092 Sevilla, Spain

2 Department of Economics, Vrije Universiteit, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands

3 Paris School of Economics, Université Paris I Panthéon-Sorbonne, 106-112 Boulevard de l'Hôpital, 75013 Paris, France

4 Department of Economics, University of Bayreuth, Universitätsstraße 30, 95447 Bayreuth, Germany

There were 43 papers submitted to the special issue, among which 15 were finally accepted for publication. As the call for papers of this special issue was general and not restricted to the participants of SING 14, it turned out that approximately two-thirds of the contributions were outside the SING 14 participants. We give a brief description of each of the accepted papers. While some contributions are concerned with the Nash equilibrium concept, most of them (80%) are related to coalitional games in various forms (market games, bankruptcy games, games over graphs, games with uncertainty), studying allocation rules, values (Shapley and Banzhaf), bargaining, revenue sharing, and cost allocations problems.

In "Cost additive rules in minimum cost spanning tree problems with multiple sources" the authors consider minimum cost spanning tree problems with multiple sources, where agents want to be connected to all sources. They extend the rule that is based on the famous Kruskal algorithm (for single source problems) to multiple source problems, introducing the family of Kruskal sharing rules. This class of rules is axiomatically characterized using additivity and independence axioms, and some special subclasses are characterized using core selection and some equal treatment axiom.

In "Does it make sense to analyse a two-sided market as a multi-choice game?" the authors introduce the Owen core and the pairwise egalitarian contribution set and analyze whether classic and multichoice two-sided market models are equivalent in terms of these solution concepts from the point of view of aggregate payoffs. It is found that there is no significant difference between the two frameworks in terms of aggregate terms, but they are not equivalent from a disaggregate perspective.

"Proportional bargaining solutions, strictly comprehensive sets and the axiom of continuity" is a short contribution showing that in the classical characterizations by Kalai and Roth of the proportional bargaining rule, continuity is a redundant axiom when the bargaining problem is defined on a strictly comprehensive set.

In "The egalitarian Shapley value: a generalization based on coalition sizes" the authors introduce a new class of values, called the Generalized α-Egalitarian Shapley values, that incorporate the level of egalitarianism for players based on the size of coalitions, allowing for more flexibility in deciding the level of solidarity for players. Along with standard axioms of TU games, two characterizations of this class of values are provided with an original interpretation of the null player property in this setting.

The paper "Proportionality, equality, and duality in bankruptcy problems with nontransferable utility" deals with a generalization of classical bankruptcy problems with monetary estate and claims in a NTU context. The authors derive several axiomatizations of the proportional rule and the constrained relative equal awards rule.

The article "On how to allocate the fixed cost of transport systems" considers the problem of allocating the fixed costs associated to a tram line over the different cities that are located along this tram line. Assuming these fixed costs to be independent of the number of passengers, suitable mechanisms for sharing the fixed costs are defined, including the uniform split, the proportional allocation and an intermediate method. These rules are axiomatically characterized using properties reflecting fairness and stability.

The paper "Games and cost of change" deals with the important role of convexity in games, letting play unfold in metric spaces. Provided cost of change exceeds the distance, the metric setting may frame proximal procedures and Nash equilibria in new manners. It concludes by briefly considering extensive-form games of the Stackelberg variety.

In "Revenue sharing for resource reallocation among project activity contractors" the authors study projects whose activities are outsourced and where resources may be transferred among the different companies involved in the project. Addressing the

cooperation among these companies, the focus lies on the prize that these receive when the project is completed before the scheduled time. After investigating the properties of the optimal resource reallocation scheme among the companies by means of a linear programming model, alternative revenue sharing schemes, based on a cooperative game theory framework, are proposed and compared.

In the paper "Uncertainty in cooperative interval games: how Hurwicz criterion compatibility leads to egalitarianism" the authors study interval cooperative games assuming that each player has a different attitude towards uncertainty. They show that a classical cooperative game arises when applying the Hurwicz criterion to each interval game. Likewise, the same Hurwicz criterion can be also applied to any interval solution of the interval cooperative game. A solution concept is Hurwicz compatible if the two procedures provide the same final payoff allocation. They characterize the class of compatible solutions that reduces to the egalitarian solution when symmetry is required. Finally, they also discuss the Shapley value and the core.

In "A value for communication situations with players having different bargaining abilities" the Myerson value for communication graph games is extended to take into account that, in addition to having different cooperation possibilities because of their position in a graph that restricts cooperation, the players also have different bargaining abilities. Because players can only obtain part of the total dividend of the connected coalitions, the dividends are discounted. Applying the Shapley value to an associated graph-restricted game gives an extension of the Myerson value that is characterized by axioms that are based on properties that reflect the effect of cooperation restrictions and bargaining abilities.

In the paper "On the costly voting model: the mean rule" a model is presented in which a policy is chosen by a group of people through the formation of a committee. The mean compromise function is considered and the distribution is not restricted to the favorite policy of the group members. Under these assumptions, the existence of a pure Nash equilibrium is established and analyzed. In the case of constant costs of participation, it is shown that when the costs increase, the size of the equilibrium committee decreases and the spread of the outcomes increases.

In "Sampling methods to estimate the Banzhaf–Owen value" two sampling methods to estimate the Banzhaf–Owen value for general cooperative games are introduced. The first approach is based on simple random sampling without replacement of those coalitions that are compatible with the system of unions. Additionally, using the interpretation of the Banzhaf–Owen value, an alternative estimation procedure based on two-stage sampling is presented reducing the required computation time. Finally, these tools are used to estimate the power of the members of the Board of Governors of the International Monetary Fund (IMF) in 2002 and 2016.

In "The Banzhaf value for generalized probabilistic communication situations" the authors extend the graph Banzhaf value to generalized probabilistic communication situations. This new value is called the probabilistic Banzhaf value. Two axiomatic characterizations of the value are presented by the probabilistic versions of component total power, fairness and balanced contributions. Furthermore, an alternative characterization of this value by using the probabilistic player potential function is provided.

The paper "Campaigning internally or externally" synthesizes the analysis of the internal competition among prominent party figures for power and status, and their cooperation in campaigning for the party's national election. Making use of a forward-looking two-period coalitional game, it provides an individual strategic foundation for the partition of existent parties into factions and new parties.

In "Computing equilibria for markets with constant returns production technologies" the authors study the computation of competitive equilibria for pure exchange economies with constant returns to scale production technologies. Introducing a number of innovative elements to the standard homotopy, it is shown that one can handle the general economic equilibrium model with constant returns production technologies in a similar way as a pure exchange economy. For the computation of equilibria in such economies a path-following algorithm is developed.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.